

THE AMERICAN MINERALOGIST

VOL. 4

JULY, 1919

No. 7

STALACTITIC BARITE FROM MADOC, ONTARIO

T. L. WALKER

University of Toronto

In the vicinity of Madoc, Ontario, there are numerous small mines which have been worked for fluorite during the war. Fluorite, calcite, and barite occur in veins which cut the Black River limestone as well as the pre-Cambrian rocks. The barite appears to be later than the fluorite, as it often forms crystalline crusts on large crystal aggregates of fluorite. The writer obtained from Mr. Edmund Hall, manager of one of the mines, some specimens of barite exhibiting a stalactitic structure of an unusual character. (See frontispiece.)

The vermiform cylindrical masses of barite, as a rule about a centimeter in diameter, are more or less curved, and, as indicated in the illustration, are not even approximately parallel. The outer surface of the individual masses is formed by the projecting ends of small crystals of barite arranged in a radial fashion with the macro-axis of the tiny crystals approximately parallel to the axis of the aggregate, while the faces of the projecting part of the crystals appear to be a macrodome (102). There is in each cylinder a small tubular opening about half a millimeter in diameter, in the center of the crystal aggregate.

The mineral has a specific gravity of 4.29 and is white in color. It contains a little magnesium and calcium and an unusually large amount of strontium replacing isomorphously part of the barium, as shown in the following analysis:

BaO.....	43.78	molecular ratio 0.286	} 0.463
SrO.....	13.95	" " 0.135	
CaO.....	0.98	" " 0.017	
MgO.....	1.01	" " 0.025	
Al ₂ O ₃	1.92		
Fe ₂ O ₃	0.48		
SO ₃	36.94	molecular ratio.....	0.462
H ₂ O.....	0.26		
	99.32		

In describing this peculiar aggregate, the writer is somewhat at a loss to account for its structure. Possibly the deposition of the barite, even tho not going on today, continued until the present land surface was attained, and the mineral was deposited on root fibers projecting down from the surface to the cavernous parts of the veins where the specimens were found. The formation of these peculiar aggregates would then find its analogy in the crystallization of rock-candy on threads suspended in saturated solutions of sugar. While the exact depth at which the specimens were obtained is not certain, it was probably less than 15 meters, as at the time of the writer's visit little work had been done below that depth.

MANGANOTANTALITE FROM AMELIA, VIRGINIA

O. IVAN LEE AND EDGAR T. WHERRY

Jersey City, N. J., and Washington, D. C.

A deep red "columbite" from Amelia (at that time called Amelia Court House) was analyzed by Dunnington¹ many years ago and shown to contain manganese in excess over iron, and tantalum slightly in excess over columbium; it should therefore be classed as a manganotantalite. That it can still be obtained on the dumps at the locality was noted by Mr. Gordon² in 1918, and in the spring of the present year one of us (O. I. L.) found there a mass of bladed albite containing an unusually large crystal of the manganotantalite. It is about 7 mm. thick, and of irregular outline, tapering from about 30 to 15 mm., with small marginal portions showing distinct crystal faces. One of these, which was practically a separate crystal 3 x 2 x 1 mm. in diameter, proved to be brilliant enough for crystallographic measurement, as described below.

As manganotantalite is not a common mineral, it seems worth while to describe the physical properties of this specimen in some detail. The color varies from reddish brown to black, but in thin splinters is ruby red to orange brown, and where fractures traverse the mass it lights up in a bright light with intense red flashes like rutile or pyrargyrite. The streak is correspondingly red brown. The luster is metallic to adamantine. Hardness

¹ *Am. Chem. J.*, **4**, 138-139, 1882.

² *Am. Min.*, **3**, 28, 1918.

= 6-6.5, rather brittle. Sp. gr. = 6.50. It is not at all magnetic, either before or after heating. Before the blowpipe it is infusible, readily becoming incandescent. In the borax bead, hot, is yellow brown to violet brown; cold, violet rose. It colors a sodium carbonate bead olive green, and when this bead is dissolved in nitric acid, sodium bismuthate yields an intense violet color, indicating abundant manganese.

The crystal was measured (by E. T. W.) on a Goldschmidt two-circle goniometer and found to have the development shown in the figure. There appear to be several forms new to columbite present, but they are too minute to yield definite reflections; these are indicated by an asterisk (*) in the angle table. A noteworthy feature is the different development of forms shown at opposite ends of the *a* axis, the crystal being ecto-hemimorphic according to the nomenclature of mimetic relations recently proposed.³ It thus resembles stibiotantalite, which is, however, endo-hemimorphic.⁴

The angular measurements obtainable on the more prominent forms proved to be in many cases certain to $\pm 2'$, so that the axial ratio could be calculated with a considerable degree of accuracy. The orientation adopted is that of Schrauf and of Goldschmidt rather than that of Dana, since the former gives the forms simpler indices, and also brings out the isomorphism between columbite and other rare-metal minerals such as euxenite, polycrase, and the above mentioned stibiotantalite. The axial ratios, on this basis, which have been determined on material of fairly well established composition, are as follows:

TABLE 1
RELATIONS BETWEEN COMPOSITION AND AXIAL RATIO IN COLUMBITE

Locality	Observer	Ta ₂ O ₅	MnO	<i>a</i> : <i>b</i> : <i>c</i>
Standish, Maine	E. S. Dana ...	9	4	0.4023:1:0.3580
Haddam, Ct.	J. D. Dana ...	30	5	0.4020:1:0.3529
Amelia, Va.	E. T. W.	53	8	0.4017:1:0.3562
Sanarka, Russia.	Arzruni.	80	14	0.4014:1:0.3505

There is accordingly in columbite a definite tho small decrease in the *a* axis (or increase in the *b* axis), with increasing Ta content, apparently independent of the Mn. On the other

³ *J. Wash. Acad. Sci.*, 9, 153-157, 1919.

⁴ Penfield and Ford, *Am. J. Sci.*, [4], 22, 61, 1906.

hand the c axis appears to be less definitely related to the composition, and perhaps changes in it are the result of balance between effects due to increase in Ta and increase in Mn.

The results of all the measurements are combined in the following angle-table; the formulas used for calculating angles are as follows: For all forms, $\cot \varphi = k/h \cdot a$. For front domes (macrodomes), $\tan \rho = h/l \cdot c/a$; for side domes (brachydomes), $\tan \rho = k/l \cdot c$; for pyramids, $\tan \rho = k/l \cdot c/\cos \varphi$.

TABLE 2
ANGLE TABLE FOR MANGANOTANTALITE FROM AMELIA, VA.
 $a : b : c = 0.4017 : 1 : 0.3562$

PROMINENT FORMS

No., Letter	Symbols		Description	Observed		Calculated	
	Gdt.	Mill.		ϕ	ρ	ϕ	ρ
1 c	0	001	Large but dull.	0° 00'	0° 00'
2 b	0 ∞	010	Dominant form.	0° 00'	90 00	0° 00'	90 00
3 a	∞ 0	100	Well developed.	90 00	"	90 00	"
4 g	∞	110	Striations on a	68 ±	"	68 07	"
5 m	∞ 3	130	Dominant prism.	39 40	"	39 41	"
6 z	∞ 5	150	Narrow, bright.	26 30	"	26 28	"
7 k	01	011	Broad but rough.	0 00	20 ±	0 00	19 36
8 o	13	131	Narrow but definite.	39 40	54 ±	39 41	54 14
9 u	1	111	Chief termination.	68 08	43 42	68 07	43 42
10 s	2	221	Well developed.	"	62 20	"	62 23
11 n	21	211	Well developed.	78 44	61 04	78 39	61 05

MORE OR LESS DOUBTFUL FORMS

12 G*	∞ 2	120	Line face, rear only.	51° ±	90° 00'	51° 13'	90° 00'
13 M*	∞ $\frac{3}{2}$	250	Line face, front only.	45 ±	"	44 52	"
14 Z*	∞ 4	140	Line face, front only.	32 ±	"	31 54	"
15 d	∞ 7	170	Line face.	19 ±	"	19 35	"
16 D*	∞ 9	190	Line face.	15 ±	"	15 28	"
17 B*	∞ 13	1.13.0	Line face.	11 ±	"	10 50	"
18 l	0 $\frac{1}{2}$	012	Rough, curved.	0 00	10 00	0 00	10 06
19 i	10	101	Line face, front only.	90 00	42 ±	90 00	41 34
20 I*	$\frac{3}{10}$	302	Line face, front only.	"	53 ±	"	53 04
21 e	20	201	Curved face.	"	61 ±	"	60 35
22 N*	2 $\frac{3}{8}$	432	Line face.	73 ±	62 ±	73 14	61 38
23 U*	$\frac{1}{4}$	443	Line face.	68 ±	52 ±	68 07	51 52
24 β	12	121	Line face, back only.	51 ±	49 ±	51 13	48 41
25 t	24	241	Line face, back only.	"	67 ±	"	66 16
26 X*	26	261	Line face, front only.	40 ±	70 ±	39 41	70 12

* Possible new forms.

With reference to the forms listed as more or less doubtful, it may be stated that the majority of them are narrow bevelings of the edges of larger forms, and can hardly be regarded as definite

faces; nevertheless there is a distinct maximum shown in the reflections of light from them at the angle given in each case, and as this angle agrees with a definite and in general rather simple form, they are at least worth recording as possible forms.

The development of the forms is shown in orthographic and clinographic projection in Fig. 1. The relative sizes of the faces in the sketch are similar to the relations actually existing on the crystal — the usual idealization having been avoided — except that the width of some of the minor forms has been exaggerated somewhat to show them better. How badly the crystal is distorted is thus clearly shown, the system being, as far as habit goes, ecto-triclinic; the especially marked ecto-hemimorphic character along axis *a* is also well brought out.

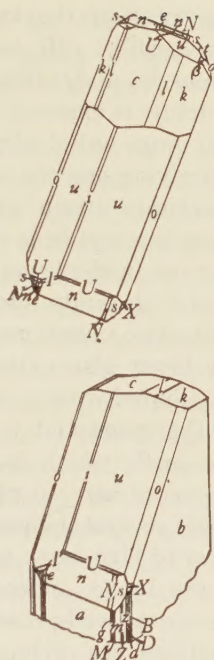


FIG. 1. Manganotantalite,
Amelia, Va.

AMBER AND ITS ORIGIN

GEORGE F. BLACK

New York Public Library

Amber is a fossil resin, derived from one or more extinct varieties of pine which flourished in great abundance during the Oligocene epoch. The strata of this formation, which belongs to the earlier part of the Tertiary Period, are particularly well developed in northern Germany, where they occupy large more or less detached areas or basins, with local lithological and paleontological variations. The basin which contains the peninsula of Samland, in East Prussia, is the great amber mine of the world, and the only place where the geological conditions admit of an advantageous study.

To the researches of Professor Zaddach, of Königsberg, we

owe most of the knowledge we possess of the formations in this locality. He thoroly explored the strand-hills forming the peninsula, and, taking a section of the cliffs where the geological structure is exposed, he found that wherever the Tertiary formation crops out it always comprises two different deposits. The underlying one consists of thick beds of glauconitic sand, which sometimes attain a height of 20 meters above the sea level. Upon this rest beds of lignite or brown coal, from 20 to 30 meters or more in thickness. Above this is a drift deposit of marl and sand with erratic blocks. All these deposits contain amber, tho in the two upper ones it occurs only in isolated pieces. Thruout the lower glauconitic or greensand bed, on the contrary, it is distributed evenly and in great abundance. In the lower part of the greensand is a dark clayey-sandy vein, known as the *blue-earth*, which is the great treasure chamber of the amber. It occurs here so plentifully that an area of 10 square meters yields several thousand kilograms of the precious material. This layer of blue-earth varies from 1 to 7 meters in thickness, and in it are found, in company with the amber, remains of wood, numerous well-preserved fossils of lower Oligocene age, marine mollusca, sea urchins, teeth of sharks, saurians, etc. The greensand also contains numerous pebbles or pieces of compact stone, which is evidently its parent rock, as it is composed of exactly similar granules of quartz bound together by a marly cement. The amber earth also abounds in fragments of chalk-marl containing Cretaceous fossils identical with those found in the Cretaceous deposits of Bornholm. This proves that the Oligocene glauconitic sand has been made from the greensand of the Cretaceous formation, and that the trees yielding the amber resin must have grown upon the sand of the early Oligocene formation which then formed the shores of the sea or estuary where the lower division of the Tertiary accumulated. Zaddach assumes that at that time the coast sank slowly, and the forest soil being washed by the waves, the amber was carried into the sea.

The deposit stretches along the peninsula from Kraxteppelin to Rantau, and Zaddach's researches showed that in many places it sinks to depths inaccessible to the miners' shafts and that it also runs out below the sea level. It was discovered within recent years that this undersea stratum extended to a distance of some 30 kilometers, and hence, as Runge points out, we have an

explanation of the presence of amber in the Baltic. Large quantities of this submarine deposit are constantly being washed ashore by the waves and tide, particularly after the heavy storms of November and December.

At the time when the amber trees grew, Europe seems to have existed as a great archipelago. Some of the fairest countries we know were at that time covered by the sea, which spread over the southeast of England, a great part of France, Belgium, Holland, Holstein, northern Germany, Bavaria, Hungary, and Italy. A vast continent existed in the north, however, which, it is believed, embraced not only the present Norway and Sweden and a large part of Russia, but also extended into the Arctic zone beyond Spitzbergen, where it was connected with Greenland and North America. Prof. Boyd Dawkins (*Early Man in Britain*) says that the existence of such a continent is the only satisfactory explanation of the presence in Europe in the Eocene and Miocene ages of the Tertiary Period of plants and animals whose nearest allies belonged to North America. To the south and eastward this continent was joined with Iceland and the British Isles and northwest France.

(To be continued)

SIR WILLIAM CROOKES

GEORGE F. KUNZ

New York City

The death of the great physicist, Sir William Crookes, on April 5, 1919, at the ripe old age of eighty-seven years, removes from our midst one of the most noted of British scientists. His long life, spent in the cause of scientific progress, enabled him to accomplish much highly important work in various directions, so that his memory will endure as long as the history of science.

From an autobiographical sketch which he prepared in his own hand-writing and presented to the writer, the following account of his life has been prepared.

He was born in London, June 17, 1832, and became, in 1848, a pupil of the noted chemist, Dr. Hofmann, at the Royal College of Chemistry. A year later, when but seventeen, he won the Ashburton Scholarship, and after studying two years longer,

was appointed junior assistant of Dr. Hofmann and soon thereafter senior assistant. In 1854 he left this position for the Radcliffe Observatory at Oxford, where he superintended the meteorological department. The following year found him professor of chemistry in the Training College at Cambridge. From 1859 dates his long editorship of the *Chemical News*, which he founded in that year. Under his able direction this journal has given perhaps the most complete record of chemical progress of any in the world.

The bent of his mind was rather toward the discovery of new laws governing matter, and new aspects of material evolution, than toward a painstaking systematization of results already attained. That this tendency was shown early in his career is proved by his discovery, in 1861, by chemical and spectroscopic tests on a residue obtained in the manufacture of sulfuric acid, of the new element thallium. Its atomic weight was reported by him to the Royal Society in 1872. His close study of the relation of the elements to one another culminated in 1887 in his theory of their genesis. The results here attained had been rendered possible by his success in producing extreme vacua, thus nearly realizing the ideal conditions of space, so that he could observe the passage of gases into the form of radiant matter. The production of this extreme tenuity of matter was also utilized for the incandescent lamp, and the experiments carried on by Crookes paved the way for the discovery of the Röntgen rays, and led up to the use of the "X-rays" in the investigation of diseased human tissue, as well as to the therapeutic use of the cathode rays. His construction of the radiometer (1875) and of the spinthariscopes (1903), had much to do with the elaboration of the electronic theory of matter.

It may be worth noting that in 1905, when addressing a meeting of the British Association at Kimberley, South Africa, on the phosphorescence of the diamond, Crookes¹ exhibited there, as an altogether exceptional example of this quality, a diamond belonging to the wife of the present writer.

For his investigations and discoveries Crookes was rewarded with many honors. He received the degree of Doctor of Science from Dublin (1904), Oxford (1904), Cape of Good Hope (1905),

¹ "Diamonds," a lecture delivered before the British Association at Kimberley, South Africa, Sept. 5, 1905, London, 1905, p. 37; also "Diamonds," London and New York, 1909, p. 101.

Cambridge (1908), Sheffield (1910) and Durham (1913), and that of LL.D. from Birmingham in 1909. Many medals were awarded him; in 1862, from the International Exhibition, London, for the discovery of thallium; 1875, the Royal Medal of the Royal Society; 1880, Gold Medal and a prize of 3,000 francs from the Académie des Sciences, for discoveries in molecular physics and radiant matter; 1885, a Gold Medal, International Inventions Exhibition, for the invention of the radiometer; 1885, the Ferguson Medal, Soc. of Arts; 1888, the Davy Medal, Royal Soc.; 1889, a Medal of the Exp. Universelle, Paris; 1889, the Albert Medal, Soc. of Arts; 1904, the Copley Medal, Royal Soc.; 1912, the Elliott Cresson Medal, Franklin Institute, Phila., Pa. The highly-prized decoration of the Order of Merit was bestowed on him in 1910. To enumerate his memberships in scientific societies, at home and abroad, would be about equivalent to giving a list of such societies. In 1877-9, 1894-6, and 1907-14, he was member of the Council of the Royal Society, and in 1906 he was elected corresponding member of the Académie des Sciences.

The writer had excellent opportunity to become personally acquainted with Sir William. He was a graceful, courtly gentleman of the old school, kindly in manner, with bright sparkling eyes, intense in a quiet way. I well remember the glee with which he showed us some natural diamond crystals of various colors, and also several diamonds set in brooches belonging to Lady Crookes, the surfaces of which had been entirely altered into graphite by the bombardment of electrons, and altho both Lady Crookes and the collector who owned the unset diamonds objected most strongly to the change operated in the stone, Sir William was delighted to know that he could produce such a change in natural crystals of carbon. In another direction, it is a great satisfaction for me that I was able to present him with a quantity of samarskite, from which he obtained a number of the rare elements with which his name is connected.

Sir William Crookes had an exceptionally keen insight into the mysteries of chemistry and physics. Had it not been for a trip made to the Cape to examine the African gold mines, he might have been the discoverer of what are now named the X-rays, for the discovery of which he had blazed the path.

His two famous lectures on diamonds at the Royal Institution

in 1896, and more particularly the lecture he delivered at Kimberley in 1905—for which the British Association for the Advancement of Science awarded him £ 600 for excess expenses, all of which sum he employed in furthering his experiments,—were so popular that tickets of admission sold freely for £ 5 apiece.

In the last letter I received from him, dated October 19, 1918, the depth of his love for his wife was tenderly and strikingly expressed. He wrote, "Evidently you have not heard of the terrible calamity that fell upon me in 1916, when I lost my dear companion, Lady Crookes, which has eclipsed anything that has happened, or that can happen in the future." They had just celebrated the Diamond Wedding, the sixtieth anniversary of their marriage.

NOTES AND NEWS

Dr. Victor Ziegler has resigned from the position of professor of geology and mineralogy in the Colorado School of Mines.

Dr. Joseph E. Pogue has been appointed curator in the Division of Mineral Technology, U. S. National Museum, and will carry on investigations in industrial economics, with special reference to the mineral industries.

Alexis A. Julien, a member of the geological department of Columbia University, New York City, and author of a number of contributions to mineralogy, especially the genesis of minerals, died on May 7 at the age of 79 years.

The death is also announced of George F. Becker, the geophysicist, on April 20, 1919, in his seventy-third year.

From German journals recently received we learn of the death on September 22, 1918, at the age of 68, of Dr. Friedrich Berwerth, director of the mineralogic-petrographic division of the Museum of Natural History in Vienna, known to mineralogists especially for his work on meteorites.

Rudolf Fuess, proprietor of the firm of crystallographic instrument makers in Steglitz, Berlin, died on November 21, 1917, at the age of 79 years.

Robert Marc, author of many articles on mineralogic subjects, especially on the application of physical-chemical methods to mineralogic problems, was killed in action on May 1, 1918. An account of his life appears in *Centr. Min. Geol.*, 1918, 229-231.

The following new books on mineralogical subjects have appeared during the past year or two, but have not been heretofore noted in our columns:

BAYLEY, W. S. Descriptive Mineralogy. 542 pp. Appleton, 1917.

BURDICK, A. J. Chemical Tests for Minerals. 93 pp. Gateway Publishing Co., Beaumont, Calif., 1917.

EDWARDS, M. E. Introduction to Optical Mineralogy and Petrography. 197 pp. Gardner Printing Co., Cleveland, Ohio.

GEORGE, R. D. Common Minerals. 463 pp. Colo. Geol. Survey, 1917.

PROCEEDINGS OF SOCIETIES

THE NEW YORK MINERALOGICAL CLUB

The Thirty-fourth Annual Meeting of the New York Mineralogical Club was held on April 16, at the American Museum of Natural History with the President, Dr. Kunz, presiding.

The following officers were elected for the ensuing year: President, George F. Kunz; Vice-President, George E. Ashby; Corresponding Secretary, Wallace G. Levison; Recording Secretary, Herbert P. Whitlock; Treasurer, Gilman S. Stanton.

Dr. Alexander Hamilton Phillips, professor of mineralogy at Princeton University, addressed the club on Isomorphism and Crystal Structure. Professor Phillips gave a short historical sketch of the theory of isomorphism and showed the important part which the theory had played in the development of modern ideas of crystal structure, as well as in other chemical and mineralogical problems.

Specimens of current interest were exhibited by Mr. Wintringham and Mr. Whitlock. The President announced the retirement of Sir Lazarus Fletcher from the directorship of the natural history department of the British Museum, and the deaths of Prof. Carl Hintze, Prof. Max Bauer, and Prof. Fritz Frech.

HERBERT P. WHITLOCK, *Recording Secretary.*

PHILADELPHIA MINERALOGICAL SOCIETY

Wagner Free Institute of Science, May 8, 1919

A stated meeting of The Philadelphia Mineralogical Society was held on the above date with the President, Dr. Leffmann, and later, the Vice-president, Mr. Trudell, in the chair. Sixteen members were present.

Mr. Samuel G. Gordon addressed the society on "The Evolution of the Goniometer." He described the contact goniometers of Carangeot, Burrow, Adelman, Penfield, and Goldschmidt; the single vertical circle goniometers of Wollaston, Studer, Degen, Mitscherlich, Schrauf, Lang, Brezina, Mallard, and Miers; the single horizontal circle goniometers of Babinet, Haidinger, Borsch, Miller, Lang, and Websky; the two-circle goniometers of Miller, Goldschmidt, Fedorov, Czapski, and Stoeber; the three-circle goniometers of Herbert Smith, Klein, and Fedorov; the universal goniometers of Groth, Viola, Klein, and Hutchinson; the suspended goniometer of Miers; and the cutting and grinding goniometer of Tutton. The talk was illustrated with antern slides, and two of the goniometers discussed.

Mr. Biernbaum reported an excursion to Perkiomen and Phoenixville, with Messrs. Frankenfield, Gordon, and Nicols. The Montgomery mine, one of the Wheatley group, is being operated, and anglesite, cerussite, pyromorphite, and calamine were found.

Mr. Frankenfield reported drusy quartz, talc, and deweylite from Newtown Square.

Mr. Trudell reported (exhibiting lantern slides) the results of the society's trip to Vanartsdalen's quarry, attended by Messrs. Hagey, Bengé, Gordon, Knabe, Warford, and Trudell. Graphite, blue quartz, blue microcline, wollastonite, wernerite, zircon, titanite, phlogopite, chondrodite, and stilbite were found.

SAMUEL G. GORDON, *Secretary*.

NEW MINERALS

FERRIERITE

R. P. D. Graham: Ferrierite, a new zeolitic mineral from British Columbia, with notes on some other Canadian minerals. *Trans. Royal Soc. Canada* [3], 12, 185-201, 1918.

NAME: After the discoverer, Dr. W. F. Ferrier.

CRYSTALLOGRAPHIC PROPERTIES

System: Orthorhombic; habit: radiated groups of very thin blades, tabular on a (100) and elongated on the c -axis; forms: a (100), b (010), and d (101), with $a : d = \text{approx. } 67^\circ 47'$.

PHYSICAL PROPERTIES

Color: colorless to white; luster: vitreous to pearly; cleavage: perfect on a (100); $H. = 3 - 3\frac{1}{2}$; sp. gr. = 2.150.

OPTICAL PROPERTIES

Biaxial; refractive indices: $\alpha = 1.478$, $\beta = 1.479$, $\gamma = 1.482$, $\gamma - \alpha = 0.004$; $2V = 50^\circ 25'$; sign +; orientation: axial plane in direction of elongation of blades and obtuse bisectrix normal to the blades (a -axis).

CHEMICAL PROPERTIES

SiO_2 69.13, Al_2O_3 11.44, CaO none, MgO 2.92, Na_2O 3.97, K_2O 0.36, H_2O 13.05, sum 100.87 per cent. This yields the ratios: $\text{SiO}_2 : \text{Al}_2\text{O}_3 : \text{MgO} : \text{Na}_2\text{O} : \text{H}_2\text{O} = 10 : 1 : 0.6 : 0.6 : 6.5$. The mineral is thus related to morденite and ptilolite, but is remarkable in containing magnesium in place of calcium, differing thus from all other known zeolites. The water begins to come off below 100° and is then given off gradually tho not quite continuously; to bring the formula into accord with that of the related minerals, 1.35 per cent. of this water is regarded as basic, giving $\text{R}_2\text{Al}_2(\text{Si}_2\text{O}_5)_3 \cdot 6\text{H}_2\text{O}$.

OCCURRENCE

Found in a cut of the Canadian Northern Railway west of Mile Post 17, on the north shore of Kamloops Lake, B. C. Occurs intimately associated with chalcedony in seams in basalt; often covered by subsequent calcite.

E. T. W.

ABSTRACTS OF MINERALOGIC LITERATURE

FERRIERITE, A NEW ZEOLITIC MINERAL FROM BRITISH COLUMBIA, WITH NOTES ON SOME OTHER CANADIAN MINERALS. R. P. D. Graham. *Trans. Royal Soc. Canada* [3], 12, 185-201, 1918.

In addition to ferrierite, the description of which is given above, this paper includes accounts of small phenacite crystals, the first occurrence of this mineral in Canada; a pseudomorph of bismuthinite after molybdenite, attached to an unchanged crystal of the latter; a crystal of albite showing the new forms R (391), Q ($3\bar{2}1$) and S ($2\bar{3}1$); an occurrence of thaumasite from the Corporation Quarry, Montreal, with analysis; and a peculiar clay, identified by analysis as saponite, from a railroad tunnel, Montreal. E. T. W.

ALGODONITE AND WHITNEYITE. L. H. BORGSTRÖM. *Geol. för. Förh.*, **38**, 95-100, 1916; thru *J. Chem. Soc.*, **114**, ii, 169-170, 1918.

Metallographic study of these supposed minerals both before and after fusion showed algodonite to be practically homogeneous, while "whitneyite" contains admixed metallic copper. Both are decomposed before fusion, but cooling curves of the fused materials show pronounced breaks at 688° , corresponding to the eutectic $\text{Cu}_3\text{As-Cu}$. It is concluded that algodonite is a definite mineral, but whitneyite is not. [MURDOCH, *Micr. detn. opaque minerals*, 1917, came to the opposite conclusion, but he did not make adequate chemical study of his materials, so Borgström's results should be provisionally accepted. ABSTR.] E. T. W.

THE DETERMINATION OF THE SPECIFIC GRAVITY OF MINERAL FRAGMENTS BY HEAVY LIQUIDS. R. P. D. GRAHAM. *Trans. Royal Soc. Canada*, **11** (III), 51-53, 1917.

A convenient method of determining specific gravities is described, according to which a buret containing benzene is introduced thru the stopper of a large test tube containing methylene iodide. Minerals of standard specific gravities are introduced along with the unknown, and benzene allowed to run in, the amounts being observed when each standard and unknown mineral just float. The buret readings are plotted against the known gravities of the standards and that of the unknown found from the point at which its buret reading cuts the curve. E. T. W.

RADIOACTIVE MINERALS IN BAVARIA. II. F. HENRICH. *J. prakt. Chem.*, **96**, 73-85, 1917; thru *J. Chem. Soc.*, **114**, ii, 96, 1918.

To test whether the dark blue fluorite from Woelsenberg owes its color and odor to radioactivity, colorless fluorite was exposed to radium. A blue color was actually produced, and the mineral then showed green thermoluminescence; but there was no development of odor. The odor of the natural mineral is believed to be due to free fluorine. Analysis of torbernite from Leopoldsdorf indicated its formula to be $\text{Cu}(\text{UO}_2)_2(\text{PO}_4)_2 \cdot 11.5\text{H}_2\text{O}$. E. T. W.

XANTHOSIDERITE FROM SCHENDLEGG, LOWER AUSTRIA; FORMATION OF BOTRYOIDAL LIMONITE. H. LEITMEIER AND M. GOLDSCHLAG. *Centr. Min. Geol.*, **1917**, 473-477; thru *J. Chem. Soc.*, **114**, ii, 118-119, 1918.

A colloidal precipitate of iron hydroxide in the Schendlegg mine was found to have the composition of xanthosiderite. [Given as $\text{Fe}_2\text{O}_3 \cdot 2\text{H}_2\text{O}$, but the definiteness of the compound is not established. Abstractor.] After keeping for 2 years it acquired a blackish brown color and superficial metallic luster

without change in composition, and under the microscope was found to be crystalline. Brown "glaskopf" (botryoidal limonite) had thus formed.

E. T. W.

THE DISPERSION OF THE OPTIC AXIAL ANGLE OF MONOCLINIC FELDSPARS. S. Kôzu. *Bull. soc. franc. min.*, **40**, 36, 1917; *J. Geol. Soc. Tokyo*, **25** (300), 31-37, 1918. Abstr. reprinted by permission from *Chem. Abstr.*, **13** (1), 19, 1919.

An equation is presented for determining the dispersion formula of the optic axial angle in monoclinic feldspars when V is large. The refractive indices computed from this formula are compared with the observed values, determined by the total-reflectometer.

S. G. G.

TEAR-FIGURES ON CERTAIN MINERALS. MIKIO KUHARA. *Mem. Coll. Eng. Kyoto Imp. Univ.*, **1**, 267-274, 279-286, 1917; thru *Chem. Abstr.*, **13** (1), 19, 1919.

Percussion figures on stibnite, galena, sphalerite, pyrite, vivianite, enargite, calcite, gypsum, and barite are described.

E. T. W.

RADIATION PATTERN OF THE TRANSFORMATION OF MAGNESIUM HYDROXIDE TO MAGNESIUM OXIDE; SERPENTINE, MALACHITE AND PSEUDOMORPHOUS QUARTZ; BULTFONTEIN APOPHYLLITE; DIAMOND TESTS BY RADIATION PATTERNS; DIFFRACTION FROM THE EDGES OF A SQUARE PLATE OF IODINE. J. S. v. D. LINGEN. *Trans. Royal Soc. S. Africa*, **7** (1), 59-63, 1918.

A study of the space-lattices of these substances by X-rays. It was possible to trace the changes produced by the dehydration of brucite; to show that the pattern of fibrous serpentine has greater symmetry than triclinic; to show that the minute crystals of quartz pseudomorphous after crocidolite have a definite orientation; to show that in some diamonds the structure is perfect, even tho they are twinned, while others show ruptured lattices; and to produce diffraction by iodine crystals.

S. G. G.

KIMBERLEY DIAMONDS, ESPECIALLY CLEAVAGE DIAMONDS. J. R. SUTTON. *Trans. Royal Soc. S. Africa*, **7**, 65-76, 1918; abstract reprinted by permission from *Chem. Abstr.*, **13** (1), 20, 1919.

A detailed description of the physical properties of the diamonds from the several S. African localities. The stones in any one pipe are remarkably uniform, but from one to another pipe they differ markedly in quality, size, crystallization, surface, color, general appearance, texture, and tone. In addition to the gem diamonds, bort and "stewartite" also occur; the latter being a bort high in iron which is steel-gray, fibrous, equal in hardness to diamond, but lower in specific gravity (about 3.45), and also showing magnetic polarity. The explosive fracturing of diamonds is believed to be connected with the presence of inclusions having greater coefficients of expansion. Trade terms are discussed, and it is pointed out that "cleavages" includes not only broken fragments, but also misshapen stones that require cleaving before cutting. Statistics of production are included.

S. G. G.

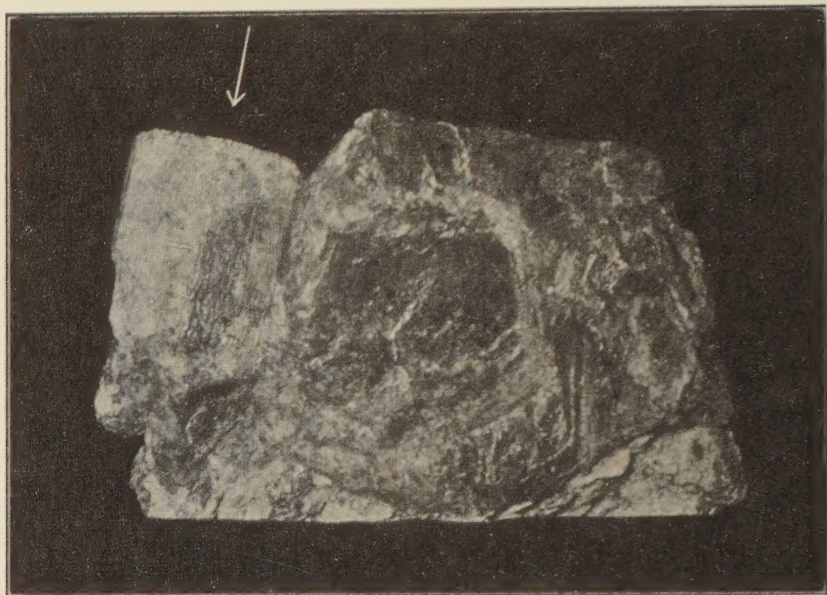


FIG. 1. GREEN BERYL. ($\frac{1}{2}$ size.)



FIG. 2. PYROXENE VAR. MALACOLITE. ($\frac{3}{4}$ size.)

NEW YORK CITY MINERALS

From "The Minerals of Broadway," Bull. 3, N. Y. Mineralogical Club.